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ABSTRACT

The first two years of "Sesame Street" were evaluated as to their effectiveness as compensatory education. The evaluation assessed progress along some 36 primary goals of the show, as well as transfer effects, home background variables, parental attitudes, and socioeconomic status factors. Over 1,300 preschool children were tested, and many were observed as they viewed the show. As "Sesame Street" was intended primarily for disadvantaged children at home who had received no educational intervention, the major concentration in the sampling was on that subpopulation. A content analysis was made of the show; a questionnaire was administered to teachers whose classes viewed the show; and the amount of viewing for all subjects was assessed using four assessment techniques. A follow-up study was carried out the second year of the specific subpopulation of the first study. In addition, at home disadvantaged children who had not viewed the show its first year were sampled. Results of the evaluation include the following: (1) many tests of young children that are currently in use are not adequate; (2) among the subjects, there were no significant effects due to race; (3) the show had a marked effect not only in the areas of rote learning of basic skills but also in higher areas of cognitive activity, this effect being shown by both boys and girls; (4) amount of viewing was significant in gains made; (5) the disadvantaged tended not to view as much; (6) viewing of "Sesame Street" affected scores on the PPVT, administered as a posttest; and (7) disadvantaged 3-year-olds learned much of the material taught during the first year of the show. (DJ)

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Research on Sesame Street:

Some Implications for Compensatory Education

Proceedings of the Second Annual Hyman Blumberg
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by

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It was probably a weak moment when the first-named author unilaterally sent off the title of this paper some months before the paper itself had to be written. At least there was a prolonged pause when we both later set about the writing and the second author asked: "And what did you mean by compensatory education?" Well, we did reach consensus, at least as the term relates to preschoolers, but it took awhile.

The first reaction to the question was, "What a silly question. Compensatory means making amends or making up for a loss, so compensatory education is the education you give disadvantaged children. More or less, that is."

Then came the reaction to the reaction. "Then what about Sesame Street? It was telecast throughout the country--not specifically to the disadvantaged. And what if both middle class and lower class children learn a great deal from the program? Does this mean the program is not compensatory? Does it mean it is compensatory only if we can somehow persuade middle class children not to watch it? Or, does this mean that the

middle class too had lacked something that they could be compensated for?" The first-named author did not respond this time. Sometimes it is wiser to cut your losses.

Titles are important, as any member of a peer group will tell you. But you do not have to be introduced in order to start a conversation. So without indicating yet what we decided I meant by the name compensatory education, let us present our paper--and then afterwards think again about the meaning of the term compensatory. First, the background to the paper, and this is provided by a brief description of our work over the past few years.

We began our work as independent evaluators of Sesame Street in the summer of 1968. At that time the goals for the first year of Sesame Street were established. The meetings brought together television writers and producers, authors of children's books, librarians, Madison Avenue executives, educational researchers, child psychologists and psychiatrists, movie moguls, and even teachers of preschool children. And these meetings themselves provided compensatory education with the educator types learning about the world of research and of television, the academic researcher types learning about the world of television

and about how young children behave, and the television types learning about the wonderful worlds of education and research.

Some behavioral goals were selected following those meetings; they were couched in behavioral terms and grouped in four sections:

1. Symbolic Representation (letters, numbers, geometric forms)
2. Cognitive Processes (perceptual discrimination, relational concepts, classification, sorting)
3. The Natural and Physical Environment (animals, machines)
4. The Social Environment (social skills such as cooperation and sharing, community members)

Some of these goals were established as ones to be emphasized and were given greater time on the show. They were mainly in the cognitive area of symbolic representation and cognitive processes, and almost all of them were assessed in the first year evaluation.

Two major principles guided us in the evaluation. First we felt it important to look for unintended as well as intended outcomes. That is, the goals of the show were important, and we certainly hoped to assess the effects of viewing the show in relation to those goals. But we felt that was not enough. The medical

model of evaluation reminds us that concentrating on achieving intended outcomes and ignoring side-effects can lead to some horribly wrong overall evaluations--for example, as in the original testing of thalidomide (Scriven, 1967).

A second major principle we considered was that interactions may tell us more in an evaluation than main effects. That is, in a worthwhile evaluation we must discover not only if the educational intervention, in general, works (an important question, of course). For the long run we should also try to discover which children it works best for, which children it does not seem to work for, and the conditions under which it operates most efficiently. Too often evaluations have concluded that a new program is of little consequence, when in fact it is a boon to some children and a ruin to other children, but when averaged over all children, its effectiveness seems little different from that of the old program.

The application of these two principles in the summative research for Sesame Street caused us to assess at pretest and posttest times not only progress along some thirty-six primary goals of the show but also transfer effects, home background variables, parental attitudes, and socioeconomic status factors. We decided to sample children from middle class suburbia, lower

class northern and western urban ghettos, and lower class sections of a southern town; rural children; Spanish-speaking children; children at home and children in Head Start and nursery schools; boys and girls; black children and white children; and 3-, 4-, and 5-year-old children. You will, of course, notice that these categories are not necessarily mutually exclusive.

Initially we tested over 1,300 children in five sites across the country. Then we observed many of them viewing the show, made a content analysis of the show itself, administered a questionnaire to teachers whose classes viewed the show, and assessed the amount of viewing for all the subjects in the study using four different assessment techniques. When evaluating a program in which side-effects and interactions are considered important, the study has to be wide-ranging, the sampling extensive, and the statistics multivariate (Freeman, 1963).

Nonetheless, despite the decision to spread our attention to different groups of preschool children, we also noted that Sesame Street was primarily intended for disadvantaged children, at home, without benefit of Head Start or similar formal educational experience.

Therefore, our major concentration in the sampling was on this particular subpopulation.

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Our experimental design in the evaluation of the first year of Sesame Street was much better in prospect than in retrospect. We randomly assigned children to either an encouraged to view group or a not encouraged to view group in each of the five field sites where we operated. Unfortunately, we had expected, on good evidence, that few children would view unless specifically encouraged to do so. However, in fact most children viewed the show at least some of the time irrespective of our assignment to experimental or control conditions. Thus, we were forced to analyze our data in a number of ways different from our original intentions. We think that the analyses we carried out provided convincing evidence to allow us to draw a number of specific and more general conclusions indicating the merit of the show for all groups of children studied. Our report on the first year is available (Ball and Bogatz, 1970) and an extensive review of the report is being published under a grant from the Russel Sage Foundation (Cook, 1972).

We also carried out a major evaluation of the second year of Sesame Street including a follow-up study of those first year subjects who were disadvantaged and at home (not in school) during the first year of the show (Bogatz and Ball, 1971).

The second year of Sesame Street saw an expansion of the show's goals to achieve somewhat wider curriculum coverage and to include more difficult topics in goal areas already established in the first year. For example, classification on the basis of a single criterion was a goal in both years but in the second year double classification was also included. Similarly, counting 1-10 was extended to 1-20, and simple addition and subtraction became goals for the first time in the second year. The replication element in the second year study took us to two new sites where we sampled only at home disadvantaged children who had not viewed the show in its first year. We were interested in seeing if effects noted in the first year were also seen in the second year and whether the new and extended goals were achieved. In one site, the only means of obtaining access to the show was through cable and we assigned cable to only half our subjects. The other site had an ultra high frequency (UHF) television channel that indeed attracted few viewers from ghetto areas unless a special effort was made specifically to encourage viewing a show. The result was that in the second year study the encouraged to view (experimental) subjects did view and a major proportion of the not encouraged to view (control) subjects did not view. Our subsequent analyses of the

second year data were easier to interpret than those of the first year data. They supported the general finding that the show benefited the viewer over a range of goal areas but we also found that the new, extended goal areas were not well learned in comparison to the more basic goals carried over from the first year.

Another aspect of the second year study was the follow-up of at home disadvantaged children from the first year. About half of them went on to school in the second year, while the others remained without this benefit. We tested both these groups of children in October 1970 and May 1971, coinciding with the beginning and ending of the second year Sesame Street series. We also obtained from the teachers of those who went on to school a ranking of our subjects in relation to the other children in the class on seven criteria. We found that a second year of viewing had positive effects over just one year of viewing but mainly in the new, extended goals areas. Thus, the producers of the show have the dilemma of deciding whether to concentrate on simple and basic goals to the benefit of the younger children viewing for the first time or to put effort into extended goal areas, thereby benefiting somewhat older children viewing for a second year.

To this point we have not been particularly specific about our measures, our field operations, or our results

and conclusions. The purpose has been mainly to sketch a general outline upon which to base our implications for compensatory education. As we present the implications, the sketched outline of the evaluation will doubtless be given greater detail, and if the reader becomes really interested there is always recourse to the two reports.

We again have to confront the problem of what is compensatory education. One way of looking at it, and the one that I suspect most of us fuzzily use, is to regard compensatory education as education specifically provided for disadvantaged children. Examples would be the Head Start program or Title I programs of the Elementary and Secondary School Education Act. Then, we might legitimately ask: What does our Sesame Street research tell us that has implications for such education? Over this approach, there are some major implications.

Measures

Perhaps because we were conducting an evaluation pointed towards assessing a number of specific goals, we were interested in using measures that would provide a clear picture of status with respect to a specific goal. At least among the arsenal of tests available for use with young children, we found the situation was appalling. Take, for example, items such as: "Put the green marbles in the square box." If the child gets it wrong is it because he does not know the meaning of "green," "marbles,"

"square," or "box"? Or, what if the child is given a stimulus triangle and asked if she can find another one just like it embedded in a larger drawing? The child is asked to trace around it. She cannot perform the task correctly. Does this mean that she did not find it, that she has poor motor coordination, or that she does not want to play games with the tester? In one well-known standardized test for 5-year-olds, we found that the percentage passing national norms provided for a particular counting item were lower than we had obtained at pretest with 4-year-old disadvantaged children. Then we looked at the administration manual where we found the instruction for the children was: "We are now going to play a number game. Look at the pictures of the fish bowls at the top of the page. Let's pretend that there are five tables in your class and each table has a fish bowl on it. See the large letters above the fish bowls. These letters are A, B, C, D, and E. Listen carefully. In which bowl do you see just three fish?" What happens to a child who does not understand words like pretend and who has never seen a fish bowl?

Now the point that we are trying to make is this. If we are to develop and improve compensatory education we must have measures that will allow us to learn with reasonable clarity what we are accomplishing. Frankly, our

experience as we developed the test battery for Sesame Street, and again as we developed our tests for The Electric Company (The Electric Battery), was that many tests of young children currently in use are lacking: they are unnecessarily difficult to administer; often they lack face, content, and construct validity; and, peculiarly, they seem to assume that if they are individually administered tests they had better involve the tester in making loose subjective and clinical judgments about the child's performance. It does not surprise us, therefore, that our understanding of compensatory education remains at a low level. Science can hardly be expected to flourish without adequate measuring instruments.

Race

At a time when genetics, race, and education were becoming mixed into a rather emotional stew, we had the interesting experience of meeting poverty groups in order to obtain their cooperation in our evaluation of Sesame Street. More than once we were pointedly asked by black community leaders whether we were simply trying to prove their children were dumb again; and more than once we argued, perhaps overly glibly, that it was Sesame Street we were trying to evaluate and not their children. The fact is that we did collect a lot of data on disadvantaged children, both black and white. It was our intention not

to make black versus white comparisons and indeed we kept our resolution during the preparation of our first report. We analyzed the data from our disadvantaged sample in terms of amount of viewing and eschewed the additional possible independent factor of race. Our major reasons were that we had already indicated to those community groups who had cooperated with us that this kind of analysis would take place, and that we were not certain at all that our black disadvantaged were comparable to our white disadvantaged. Thus, we feared the problem of unfair and invidious comparisons.

After the publication of our first-year study we did look at our data to see if disadvantaged black viewers gained more compared to disadvantaged black non-viewers and if disadvantaged white viewers gained more compared to disadvantaged white non-viewers. As we surveyed these groupings of the data we were struck by the similarity of the scores of the disadvantaged black children and the disadvantaged white children within each site at pretest, and we were also struck by the similarity of gains made in relation to their degree of viewing. Subsequent multivariate analyses of variance confirmed our impression that among our disadvantaged there were no significant effects due to race.

A curious exception deserves some reflection. Most of our tests were specially developed to assess status and growth on the goal areas being taught on the show. Here the pretest and gain scores of black and white children were quite similar. However, in the first-year evaluation, we also used, at pretest only, a standardized test, the Peabody Picture Vocabulary Test (PPVT), in order better to describe our subjects and as a covariate in covariance analyses of gains. To our surprise, there were systematic differences between black and white disadvantaged children on this test to the degree of over half a standard deviation. In IQ terms it was about a ten-point difference favoring the whites. Note that of the pictures in the test only two are of blacks (a spear carrier and a porter). Look too at the specific vocabulary called for. Of course, it could be that our black sample study had a poorer vocabulary than our white sample, but it could also be a function of the test used; this seems a perfectly reasonable assumption since scores on the other tests did not differ in this way.

In general then, black and white disadvantaged preschool children from within the same testing sites seemed to be quite comparable at pretest and gained similarly given similar amounts of viewing over the six months of the show. The exception was their present status

on the PPVT, and we consider this to be more likely a function of the test rather than an indication of lower vocabulary levels by the black children. Thus, proposals to use different forms of education for disadvantaged black children than for disadvantaged white children have no substantiation from our Sesame Street data. Rather, race was shown to be a relatively unimportant factor in determining the degree to which a child could learn from the show.

Non-traditional Education

The traditional form of education used with preschool children has been to provide small group settings with one or two adults to usually no more than fifteen or so children. Play and fun have often been advocated as an important if not essential element in the process; we can look back to the writings and work of Pestalozzi, Froebel, and perhaps even Plato to show that these ideas are not exactly new. Similarly, experts in early education have usually stressed the need for a close relationship between adult and child for learning to occur optimally.

Sesame Street had objectives that were much more limited than a good nursery school or Head Start program. Nonetheless, the objectives and some of the gains were by no means trivial. We remember the air of somber, sober, and scientific pessimism that pervaded its advisory boards

before the show began telecasting for the first time. How could an hour a day on television have much effect? If a teacher in a school all day with her class accounts for so little of the variance of scores among classes (Wolf, 1966), how would an object with a mean diagonal measurement of 21 inches do better and without personal contact? We were also told that preschoolers have very small attention spans and that disadvantaged preschoolers have even tinier ones.

The facts are that the show was seen to have a marked effect, not only in areas of rote learning of basic skills such as counting and in simple contiguity association learning as in learning the names of letters and numbers, but also in higher areas of cognitive activity such as sorting and classifying pictorial representations and, as far as we could tell, in attitudinal areas such as attitude to the race of others. Furthermore, these effects were obtained with boys as well as with girls, yet many studies suggest that boys are the ones who present the majority of the learning problems.

Thus, the implication seems clear that we should put greater effort into non-traditional means of educating young disadvantaged children, not to supplant but to supplement older ways. It also seems clear that the

cherished ideas of some educators about early education might not stand close scrutiny and that while close emotional ties might be important for learning in the emotional and interpersonal areas, they might not be so important for learning in the cognitive areas.

Delivery Problems

There is a couplet in a song with the words, "Ain't We Got Fun?" that has the interesting social comment that the rich get rich and the poor get children. An allied problem is that educationally rich middle class parents tend to make use of the educational opportunities that are available for their children, whereas the educationally impoverished lower class tends not to do so. Thus, when Sesame Street appeared on the television screen and the educational scene, it quickly acquired a large audience. But it was proportionately larger for the middle class than for the lower class. Further, within the disadvantaged, it was the most disadvantaged who viewed least. Educators with a sense of social justice similarly note that the ghetto children they would most like to reach are the ones hardest to reach.

In our evaluation of the second year of Sesame Street, we assigned children to encouraged to view and not encouraged to view conditions. We assessed amount of

viewing for all the children because it was impossible to ensure that all encouraged children would view all the shows, just as it was impossible to ensure that all not encouraged children would view none of the shows.

In fact, the distribution of subjects looked like this:

	Non- <u>Viewers</u>	Moderate <u>Viewers</u>	Frequent <u>Viewers</u>	<u>Total</u>
Encouraged	9	43	78	130
Not-encouraged	99	46	8	153

We were interested in extracting the encouragement effect from the viewing effect, since both effects were somewhat confounded and since both effects seemed to be positive. We carried out a univariate analysis of covariance on the grand total gain score and obtained the following results: The regression of viewing on total gain was similar for the encouraged and not encouraged groups. That is, amount of viewing affected both groups similarly.

This regression was significantly different from zero, indicating that amount of viewing was a significant factor influencing gains.

There was a significant encouragement effect irrespective of amount of viewing.

From other analyses we could conclude that the disadvantaged gained as much as the more advantaged if they viewed as much. However, the tendency was for them not to view as much. The important question was what

would happen if disadvantaged children were to view the show as much as the advantaged because of some conscious effort to get them to do so. The answer seems to be that such encouraged viewers will do at least as well as children who view entirely of their own volition. Furthermore, the act of encouragement itself may have beneficial effects. For example, the child's mother is more likely to view with the child and then talk about the show with the child if encouragement to view occurs.

The implication we draw from this is, we hope, now clear. While it is true that the more disadvantaged tend to avail themselves less of educational opportunities, it also seems to be true that a conscious program of encouragement is worthwhile. We should spend money on providing compensatory educational programs; we should also spend money on delivery systems to ensure that those who need these programs receive these programs.

IQ

We have already discussed the peculiar results obtained with the PPVT in our first-year evaluation, i.e. black disadvantaged children performed less well than white disadvantaged children on this test. However, in other respects the test proved useful in that it enabled us to describe our sampled children and compare them to those in other studies, and it enabled us to examine, if imprecisely, the moderating effects of vocabulary size on learning.

Soon after the close of the first-year series, a number of unsolicited letters arrived at our office from school teachers and school psychologists in which the thought was expressed that the new groups of children reaching their schools were "brighter" than in the past and that almost invariably the mothers were mentioning Sesame Street as the causal agent.

We are all sophisticated enough to realize that an IQ test, no matter its pretensions, is an achievement test. We also realize that the PPVT, despite the fact that it provides IQ conversions, is basically an oral receptive vocabulary test. However, vocabulary is traditionally seen as one slice (though perhaps a thin one) of the pie we call intelligence. Therefore, with, I hope, uncharacteristic foolhardiness we gave the PPVT as a posttest as well as a pretest in the second year evaluation both to the follow-up subjects and to the new, replication subjects. In almost all of our analyses of the second-year data, a clear trend emerged. Viewing of Sesame Street affected scores on the PPVT, and, therefore, if one had the faith to make the conversion, affected IQ scores. Note that children with higher IQ scores on their permanent records might conceivably be treated differently from children with lower scores.

This finding that Sesame Street affects IQ scores as determined by one particular test is not so different from other studies (though the medium of television has never before been accused of raising the intelligence of the viewer).

Compensatory programs can affect IQ scores positively just as failure to provide educational programs can affect them negatively. Nonetheless, it is difficult to resist the temptation of pointing this out, and it is doubly difficult when a television show is involved. So we have not resisted the temptation.

Age

The final implication we wish to draw using this model of compensatory education as it applied to preschoolers, deals with age. In our Sesame Street evaluations we studied 3-, 4-, and 5-year-old disadvantaged children. We subdivided each age group by amount of viewing. The results from the Sesame Street test battery at pretest and again at posttest are presented graphically in Figure 1.

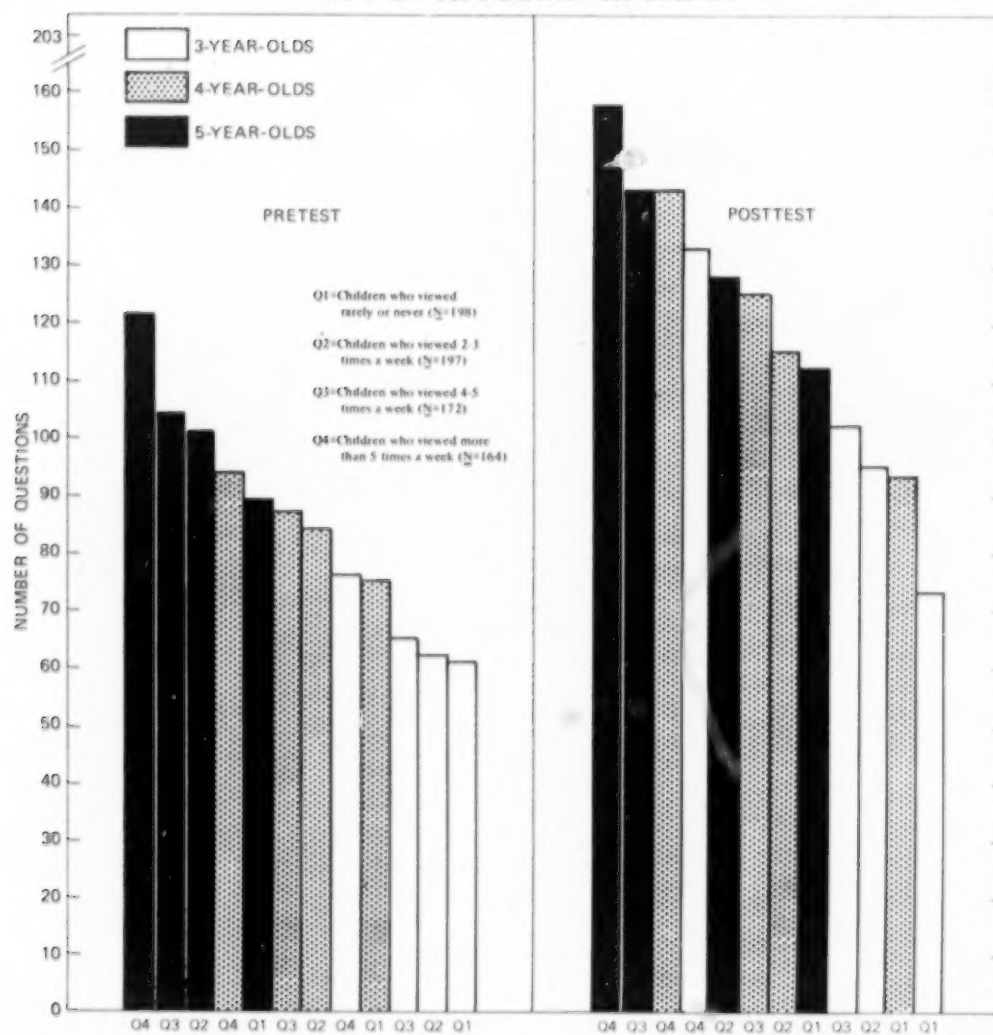
 Insert Figure 1 about here

Before Sesame Street went on the air, older children almost invariably performed higher on the test than younger children. After Sesame Street, however, 3-year-olds who watched most (Q4) scored higher at posttest than three of the 4-year-old groups and two of the 5-year-old groups, although these 3-year-olds had pretest scores lower than all 5-year-olds and all but one of the 4-year-old groups. In other words, the placement of the children along the scale measuring the goals of Sesame

Figure 1

Pretest and Posttest Scores of 3-, 4-,
and 5-year-old Disadvantaged Children

FIGURE 1
PRETEST AND POSTTEST SCORES OF 3-, 4-,
AND 5-YEAR-OLD DISADVANTAGED CHILDREN



Street was very dependent on age at pretest, while at posttest it was much more related to amount of viewing.

If the viewing of Sesame Street were not effective and the gains noted in the first-year study among the four viewing groups were primarily a matter of differential growth rates noted at pretest, then the juxtapositions of age groupings at posttest would be difficult indeed to explain.

The implication here is that disadvantaged 3-year-olds were quite capable of learning much of the knowledge and skills taught on the first year of Sesame Street. Perhaps in compensatory education we aim too low at too high an age level. More positively, perhaps we should think of beginning with younger than 4-year-old children and perhaps we should raise our expectations of what these very young children can learn.

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An effort has been made in the preceding pages to draw implications for compensatory education where compensatory education has been defined in terms of disadvantaged children. We did include in our first year evaluation a group of advantaged middle class children from suburban Philadelphia. We had purposely chosen a site where we were not studying disadvantaged children because we were not initially interested in comparing these two groups. Rather we were making internal comparisons (viewing versus non-viewing) within each group.

However, we were rather surprised by our results.
Figure 2 presents pretest and posttest scores of advantaged

Insert Figure 2 about here

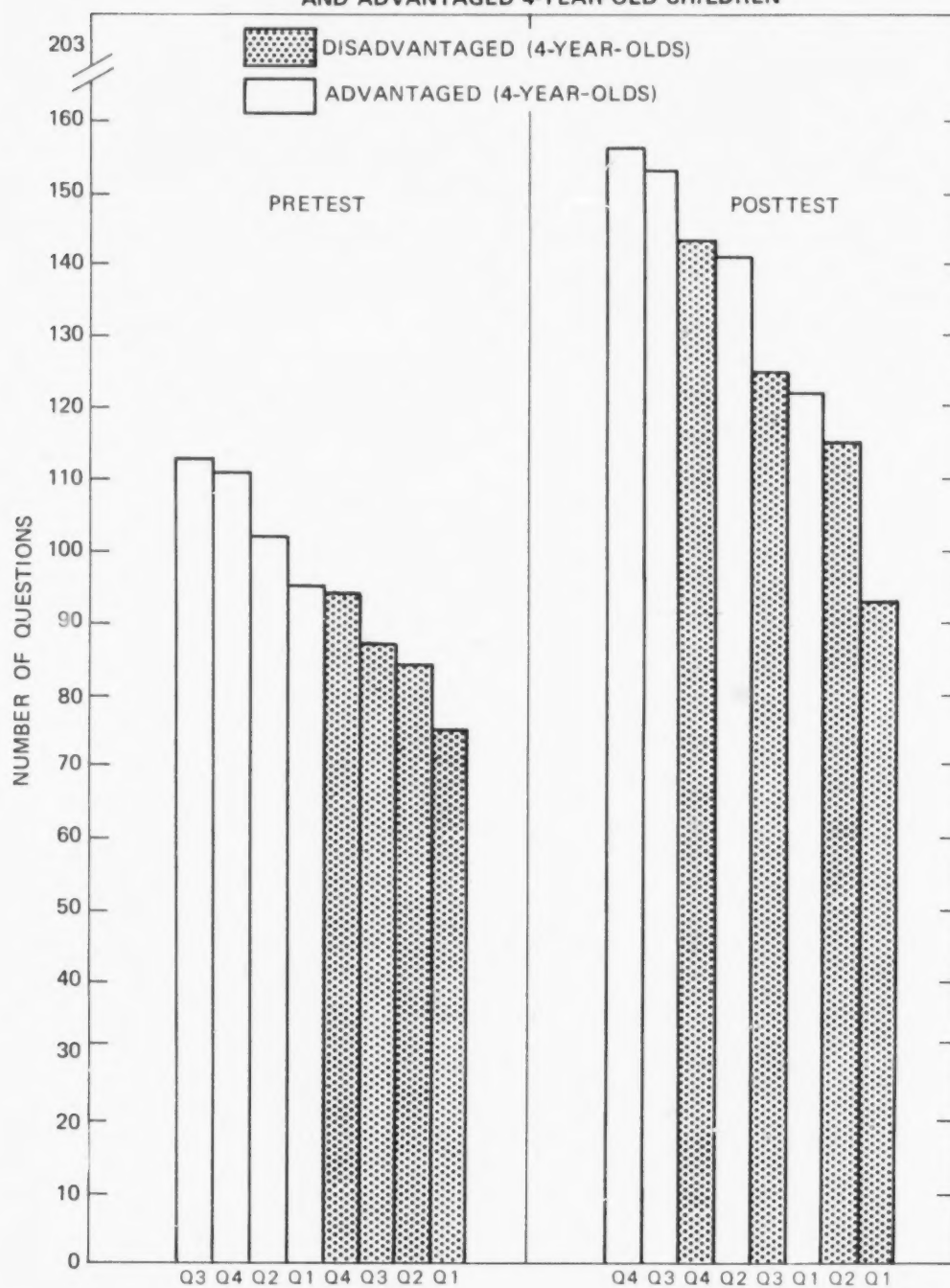
and disadvantaged children. The frequent viewing disadvantaged children not only outgained but surpassed the infrequent viewing middle class children. This was the point that interested us and it was also the point that drew criticism upon us. In one sense the gap between middle and lower class children was being diminished from pretest to posttest; but it should also be noted the middle class children tend to gravitate to the frequent viewing groups whereas disadvantaged children tend toward the less frequent viewing groups. Some kind of weighting, therefore, might lead us to a different conclusion. We reject, however, the analysis of our data [Sprigle (1971), repeated by Ingersoll (1971)] in which non-viewers were included in the comparison in order to show middle class children widening their distance from lower class children. Predictably, lower class non-viewers are going to learn less than middle class non-viewers. Would we argue that Head Start is ineffective because lower class children who do not attend are increasingly disadvantaged in comparison with middle class children?

The major point for this paper, however, is not the one we have been presenting. What is worth noting for

Figure 2

Pretest and Posttest Scores of
Disadvantaged and Advantaged 4-year-old Children

FIGURE 2
PRETEST AND POSTTEST SCORES OF DISADVANTAGED
AND ADVANTAGED 4-YEAR-OLD CHILDREN



purposes of this presentation is that the effects of the show can be clearly discerned on middle class advantaged children too. Note that this group included children attending nursery school. This suggests to us that while for good, socially-responsible reasons we spend much of our time concerning ourselves at the preschool level with disadvantaged children, we might legitimately be concerning ourselves with middle class children too. Perhaps even with these children their educational input is by no means optimal.

If compensatory education is related to what are Webster's Dictionary second and fourth definitions ("to make proper payment to" or "to offset an error, defect, or undesired effect"), then we may well decide that many children need compensatory education, including a large proportion we fail to recognize when we conventionally think of the term "compensatory."

This paper began by asking: What is compensatory education? It begged the question first by briefly describing the evaluations of Sesame Street we have carried out; then it took a possible definition of compensatory education and drew six implications assuming the validity of the definition; finally, it took an alternative definition and pointed out the implication for preschool education if this were true. Actually, however, like most semantic arguments, it does not matter which definition we take. Preschool education

needs better programs, a greater variety of programs including non-traditional ones, better delivery systems so that the vast majority of children receive their benefit as opposed to the current minority who do, and better methods of assessing the value of the programs. That may seem to be a rather somber note to end this first paper in the series being presented here; but it also carries with it the message that improvements in all these areas can be effected, for our Sesame Street evaluations tell us so. We suspect strongly, too, that the subsequent papers in this conference will provide other heartening examples.

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